

ANNUAL PROGRESS REPORT

SEATO Medic Study No. 25	Studies on <u>Opisthorchis viverrini</u> in Thailand Morphology of <u>Opisthorchis viverrini</u> .
Project No. 3A 025601 A 811	Military Medical Research Program S. E. Asia
Task 01:	Military Medical Research Program S. E. Asia
Subtask 01:	Military Medical Research Program SEASIA (Thailand)
Reporting Installation:	US Army-SEATO Medical Research Laboratory APO 146, San Francisco, California. Division of Medical Research Laboratories Department of Medical Zoology
Period Covered by Report:	1 April 1963 to 31 March 1964
Principal Investigator:	Major Dale E. Wykoff, MSC
Associate Investigator:	MSGt Max M. Winn
Assistant Investigator:	Miss Kobkul Ariyaparakai
Reports Control Symbol:	MEDDH-288
Security Classification:	UNCLASSIFIED

ABSTRACT

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The purpose of this study was to ascertain the specific morphological characteristics by which O. viverrini can be differentiated from O. felineus. Each of eight characteristics which presumably differentiate the two species is examined, and it is the opinion of the investigators that differentiation can not be positively made on the characteristics of the adult stage. The sole absolute difference appears to be in the flame cell patterns of the cercariae.

BODY OF REPORT

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Final Report

Objective: This study was designed to ascertain which specific morphological characteristics in the adult stage differentiate O. viverrini from O. felineus

Description: Following the initial description of O. viverrini by Poirier, (1886) uncertainty has surrounded the validity of the species. Erhardt (1935), on the basis of findings of other investigators, but without examining O. viverrini specimens himself, reported that this species was not synonymous with O. tenuicollis. This is in contrast to the opinions of Price (1932), Vogel (1932), Faust (1949), and Dawes (1956). It should be noted that O. tenuicollis was recovered from a sea mammal, leading one to believe that marine intermediate hosts were involved. Ejamont (1937) explained this by stating that these mammals often enter estuaries to feed on cyprinoid fish infected with Opisthorchis metacercariae. He concluded that O. tenuicollis and O. felineus should be considered as subspecies. Watson (1960) reported that O. tenuicollis is synonymous with O. felineus, thus possibly making

O. tenuicollis = O. felineus = O. viverrini. The issue is further broadened by the reports of Morgan (1927) and Price (1940), who believe that Opisthorchis and Clonorchis are not sufficiently different to warrant the use of separate genera. Erhardt, et. al. (1962) list over 20 other names which may be synonymous with O. felineus. In addition to the uncertainties mentioned above, even the specific name "viverrini" appears to be incorrect because the original specimens were recovered from the civet cat, Felis viverrini (not Felis viverrinus), thus requiring the parasite to be named "Opisthorchis viverrinae" (Stempell, 1938). Consequently, it is not surprising that field workers have been troubled by this taxonomic confusion.

Various authors have reported that O. viverrini may be differentiated from O. felineus by a number of specific morphological characteristics. The flame cell patterns have been described for metacercariae of O. viverrini and O. felineus, respectively, as 2 (3+3)+(3+3+3) (Vajrasthira, et. al., 1961) and 2 (5+6)+(6+6+6) (Komiya and Tajimi, 1961). The flame cell pattern for the cercariae of O. felineus is 2 (5+5)+(5+5+5) (Komiya and Tajimi, 1941). Although this was originally described by Vogel as 2 (5)+(5+5+5+5) he is now of the opinion that the formula of Komiya and Tajimi is correct (Vogel 1963). If the flame cell patterns of the cercariae of these two species differ, there could not longer be ambiguity concerning the validity of the species O. viverrini.

Progress: Camera lucida drawings have been prepared for each of the following characteristics of O. viverrini which are supposed to differentiate it from O. felineus: 1) Greater proximity of ovary and testes; 2) Deeper lobulation of the testes; 3) More lobed ovary; 4) Location of the posterior testes near the tip of the caecum; 5) More elongate esophagus; 6) Aggregation of vitellaria into a few clusters of granular material; 7) The shorter and less winding seminal vesicle; and 8), Different size and shape of eggs. Comparisons fail to reveal any single characteristic by which the two species could be accurately differentiated. The validity of the species O. viverrini not being established on the basis of adult specimens examined, a study was made of the cercariae. In general, it was found to be similar to that of O. felineus but, working together with Dr Y. Komiya, it was found that the cercaria could be unquestionably differentiated from that of O. felineus on the basis of the flame cell pattern, 2/(3+3)+(3+3+3)/ for O. viverrini and 2/(5+5)+(5+5+5) for O. felineus.

Summary: The species O. viverrini could not be differentiated from O. felineus on the basis of the adult worm, but the flame cell pattern of the cercaria not only offers a positive (if cumbersome) means of differentiation but removes any ambiguity concerning the validity of the species.

Conclusion: O. viverrini and O. felineus are both valid species, but differentiation of the adult worms is extremely difficult if not impossible.

List of Publications: This report is being incorporated into the following paper which is now in manuscript and which will be submitted for publication in May, 1964: Wykoff, D. E., Harinasuta, C., Juttijudata, P., and Winn, M. M. Studies on Opisthorchis viverrini in Thailand - Notes on the life cycle and comparison with O. felineus.